

Claims

1. A method for producing a composite yarn (FC), comprising at least one elastic yarn (F1, F2) covered with at least one covering yarn (FT), and automatically replacing spools of elastic yarn characterized by:
 - 5 a. providing a first spool (R1) of a first elastic yarn (F1) and feeding said first yarn to an interlacing jet (19) where it is covered with said covering yarn (FT) to produce said composite yarn (FC) which is wound on a developing cop (BC);
 - b. providing a second spool (R2) of a second elastic yarn (F2);
 - 10 c. when the first spool (R1) of elastic yarn must be replaced with the second spool (R2) of elastic yarn, interrupting composite yarn (FC) feeding to said developing cop (BC) and replacing the developing cop with a new tube (T);
 - d. inserting the second elastic yarn (F2) in said interlacing jet (19) to resume therewith the formation of said composite yarn (FC), said second elastic yarn (F2) being joined to said covering yarn (FT) which moves continuously;
 - 15 e. starting winding composite yarn on said new tube (T).
2. Method according to claim 1, characterized in that the first spool (R1) is arranged in a working position and the second spool (R2) is arranged in a standby position, and that said second spool (R2) is carried to said working position and said first spool (R1) is removed from said working position when the first spool (R1) must be replaced.
- 20 3. Method according to claim 1, characterized by withholding the initial free end of said second elastic yarn (F2) in a retaining member (27), before replacing inserting the second elastic yarn (F2) in said interlacing jet (19).
4. Method according to claim 1, characterized by collecting at least the covering yarn (FT) fed via said interlacing jet (19) during the time elapsing between the winding interruption of the developing cop (BC) and the start of winding of the composite yarn on said new tube (T).
- 30 5. Method according to one or more of the preceding claims, characterized in that said second elastic yarn (F2) is joined to the covering yarn (FT) in said interlacing jet (19).

6. Method according to claims 3 and 5, characterized in that the initial free end of the second elastic yarn (F2) is withheld by said retaining member (27) downstream of the interlacing jet (19), with respect to the direction of feeding of the yarn through said interlacing jet (19).

5 7. Method according to one or more of the preceding claims, characterized in that said covering yarn (FT) is a multiple filament yarn.

8. Method according to one or more of the preceding claims, characterized in that said covering yarn (FT) is textured.

9. Method according to claim 8, characterized in that said covering
10 yarn (FT) is fed along a feeding path from a feeding cop (B1) to said interlacing jet (19) and textured along said feeding path.

10. Method according to one or more of the preceding claims, characterized by detecting the end of the first elastic yarn (F1), and by stopping the feeding of the composite yarn (FC) to the developing cop (BC)
15 and introducing the second elastic yarn (F2) in said interlacing jet upon detection of the end of the first elastic yarn (F1).

11. Method according to one or more of the preceding claims, characterized in that the covering yarn (FT), which is continuously fed, is collected by being sucked into a suction conduit (66) between stopping
20 feeding composite yarn (FC) to the developing cop (BC) and starting winding composite yarn on a new tube (T).

12. Method according to one or more of the preceding claims, characterized in that at least said first elastic yarn (F1) is stretched before being fed to said interlacing jet (19).

25 13. Method according to claim 12, characterized in that said covering yarn (FT) and said first elastic yarn (F1) are passed side by side in a stretching area (13) upstream of the interlacing jet (19) and fed from said stretching area to the interlacing jet along a common feeding path.

14. Method according to claim 13, characterized in that in said
30 stretching area, the first elastic yarn (F1) and the covering yarn (FT) are passed through a nip formed by two stretching rollers (15, 17).

15. Method according to claims 3 and 13, characterized in that: the initial free end of the second elastic yarn (F2) is withheld by said retaining member (27) downstream to the interlacing jet with respect to the feeding

direction of the yarn through said interlacing jet; a portion of the second elastic yarn (F2) is arranged alongside the first elastic yarn (F1) and the covering yarn (FT) between the stretching area (13) and the interlacing jet (19); and the second elastic yarn (F2) is pushed into said stretching area (13) by the side of
5 the covering yarn (FT) when feeding of the second elastic yarn (F2) to said interlacing jet is started.

16. Method according to one or more of the preceding claims, characterized in that the spool from which the elastic yarn is fed to the interlacing jet is kept into rotation around its axis to unwind the yarn.

10 17. Method according to one or more of claims 1 to 15, characterized in that the elastic yarn is unwound from the spool without rotating said spool around its axis.

18. A device for the production of a composite yarn (FC), comprising at least one elastic yarn (F1, F2) covered by at least one covering yarn (FT),
15 comprising in combination:

- an interlacing jet (19) for reciprocally joining the covering yarn (FT) and the elastic yarn (F1, F2);
- a feeding path of said covering yarn (FT) and a feeding path of said elastic yarn (F1; F2) to said interlacing jet (19);
- 20 - supporting means (37A, 37B) for spools (R1, R2) of elastic yarn;
- winding members (54, 55, 56) for winding the composite yarn (FC) on a developing cop (BC);
- a device for interrupting (57) the feeding of composite yarn (FC) to said developing cop (BC) and starting the winding of the composite yarn on
25 a new winding tube (T);

characterized in that: said supporting means (37A, 37B) for the spools of elastic yarn are suitable for arranging at least a first spool (R1) of elastic yarn and at least a second spool (R2) of elastic yarn; and that a retaining member (27) is arranged near said interlacing jet (19) to withhold an initial free end of
30 the elastic yarn of said second spool (R2) while the yarn from said first spool is fed to said interlacing jet; and that means for introducing the elastic yarn of said second spool (R2) in said interlacing jet (19) are provided.

19. Device according to claim 18, characterized by a collection member (66) for collecting the covering yarn (FT) which is fed substantially

continuously while the complete cop (BC) of composite yarn is replaced with a new winding tube (T), said collection member (66).

20. Device according to claim 19, characterized in that said collection member (66) is associated to said interrupting device (57).

5 21. Device according to claim 18, 19 or 20, characterized in that said spool supporting means (37A, 37B) are designed and arranged to support said first spool (R1) in a working position and said second spool (R2) in a standby position and to transfer said second spool (R2) from said standby position to said working position when said second spool (R2) must replace
10 said first spool (R1).

22. Device according to claim 21, characterized in that said spool supporting means (37A, 37B) are provided with a translating movement from said standby position to said working position.

23. Device according to one or more of claims 18 to 22,
15 characterized in that at least one texturing station (3) is arranged along the feeding path of the covering yarn.

24. Device according to one or more of claim 18 to 23, characterized in that said retaining member (27) of the initial free end of the elastic yarn (F2) of said second spool (R2) is combined with an introducing means (29, 31) for
20 inserting said elastic yarn in the interlacing jet (19).

25. Device according to one or more of claims 18 to 24 characterized in that said retaining member (27) is equipped with a movement for inserting said elastic yarn (F2) in said interlacing jet.

26. Device according to claim 23 or 25, characterized in that said
25 retaining member is arranged downstream of said interlacing jet (19) with respect to the feeding direction of the yarn.

27. Device according to one or more of claims 18 to 26, characterized in that it comprises a sensor (59) for generating a signal for starting the replacement procedure of the first spool (R1) of elastic yarn (F1)
30 and replacing it with a second spool (R2) of elastic yarn.

28. Device according to claim 27, characterized in that said sensor (59) detects the end of the elastic yarn (F1) of said first spool (R1).

29. Device according to one or more of claims 18 to 28, characterized in that said collecting member (66) of the covering yarn (FT)

comprises a suction member.

30. Device according to one or more of claims 18 to 29, characterized in that it comprises a stretching unit crossed by said covering yarn (FT) and by said elastic yarn (F1, F2), upstream to said interlacing jet (19).

31. Device according to claim 30, characterized in that said stretching unit comprises a pair of stretching rollers (15, 17) forming a nip crossed by said covering yarn (FT) and the elastic yarn (F1) from said first spool (R1).

32. Device according to claim 30 or 31, characterized by an inserting element (49A, 49B; 51A, 51B), which inserts the elastic yarn (F2) of said second spool (R2) inside said stretching unit (15, 17).

33. Device according to one or more of claims 18 to 31, characterized in that said interlacing jet (19) comprises a cover (23) which is opened to insert the elastic yarn (F2) from said second spool (R2).

34. Device according to one or more of claims 18 to 33, characterized in that a member for joining the head of an elastic yarn (F2) to the covering yarn (FT) is arranged upstream to said interlacing jet.

35. Device according to claim 34, characterized in that said joining member consists of an auxiliary interlacing jet.

36. Device according at least to claim 30, characterized in that an oven (11) crossed by said covering yarn is arranged along the path of said covering yarn, upstream of said stretching unit (13) for stabilizing the yarn.

37. Device according to one or more of claims 18 to 36, characterized in that an unwinding means is provided to rotate the spool from which the elastic yarn is fed to said interlacing jet.

38. Device according to claim 37, characterized in that said unwinding means is an unwinding roller in contact with the outer surface of the spool being unwound.